Letters to the Editor . . .

THE ARMY MEDICAL LIBRARY

Physicians who served in World War II have genuine occasion to be thankful for the splendid services rendered by the Army Medical Library. Reference texts, periodicals, and micro-film of important reference material were sent promptly for the use of medical officers at medical installations anywhere that troops were operating. This service assisted materially in maintaining the high standard of technical efficiency accomplished by the medical service during the war.

Now that we are gradually returning to peace, it would be wise for physicians to remember the services which the Army Medical Library can continue to furnish. The Army Medical Library publishes a "Current List of Medical Literature" which all county societies may obtain, for the purpose of aiding in acquiring important current medical literature. The Army Medical Library will continue to assist physicians throughout the country in obtaining important medical literature, by request through an appropriate local medical library.

The Army Medical Library is the greatest repository for medical literature in the world. It has the largest and most complete collections of all types of medical books and journals in existence.

Unfortunately, the Army Medical Library at present is housed in an old fire trap of a building on the Washington Mall. Congress has, however, authorized the erection of a new building to house the Army Medical Library in proximity to the great Library of Congress. It is expected that funds for this new building will be provided at the next session of Congress. Physicians can help greatly in asking congressmen to support the work of the Army Medical Library.

To catalog and classify the great collections of the Army Medical Library is no slight task. The Index Catalog of the Army Medical Library is the most important index of world medical literature. The Army Medical Library cooperates closely with the American Medical Association in maintaining the *Quarterly Cumulative Index*, which is used so extensively by physicians and scientists everywhere to keep abreast of current medical advance.

California physicians have a particular interest in the Army Medical Library because it has assisted for so many years in maintaining the highest quality of medical library service on the Pacific Coast. The Army Medical Library helped in establishing the medical periodical service for rural physicians, first proposed by Doctor George Kress, and maintained by the Library of the University of California Medical Center. It might be wise for the California Medical Association to make arrangements with the University of California for the revival of this important service.

It is essential in the modern practice of medicine for physicians to keep abreast of current advances. This can best be done by systematic attention to important medical periodicals, where original work appears, or where appropriate references and reviews are given to significant new developments. It is essential that physicians always and everywhere support local medical library efforts. It is also essential that physicians throughout the country unite in giving the best possible support to the great central collection of medical books which serves the whole country, the Army Medical Library.

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CRYSTALLIZATION OF BACTERIAL TOXINS

Successful crystallization of tetanal and botulinal toxins are reported by Lamanna[1] and associates of Camp Detrick, Maryland and Pillemer[2] and his coworkers of the Pathological Institute, Western Reserve University.

Lamanna inoculated five gallon carboy lots of a 0.3 per cent casein, 0.5 per cent glucose and 1 per cent alkali-treated corn steep liquor medium with Clostridium botulinum. Maximum toxin production was reached after 80 hours' incubation at 34°C. At this time the intraperitoneal mouse titer reached 800,000 MLD per cc.

In the first step of chemical purification the cultures were precipitated at pH 3.5 by the addition of HCl. The resulting "acid mud" consisted of a mixture of toxin, nucleic acid, undigested casein, material from corn steep and organisms. In seven succeeding steps the toxin was resuspended or redissolved in decreasing volumes of distilled water or salt solution. From each it centrifuged, salted out or otherwise separated from one or more of the contaminants. The final product was a 300-fold concentration of purified toxin in dilute sodium acetate solution. After standing overnight in the refrigerator, toxin crystals separated from this solution. Recrystallization was effected from a supersaturated distilled water solution.

The crystals thus obtained were needle-like structures from 5 to 7 microns in width, and 85 to 125 microns long. The crystals give positive protein reactions. Electrophoretic mobility suggested that the crystalline material was a single chemical substance. Membrane diffusion suggested a molecular weight between 1 and 2 million.

Adopting a somewhat similar technique Pillemer[2] and his associates isolated and crystallized tetanal toxin. Crystallization of the final product occurred slowly at -8°C from a 25 per cent methyl alcohol solution. The crystals disintegrated and redissolved in the mother liquor at temperatures above 0°C. Microscopically the crystals appeared as irregular triangular or rhomboid structures, with an occasional elongated spear-shaped form. Solutions of the crystals give positive protein reactions. The material showed constant biological activity on recrystallization. The toxicity was readily destroyed by heat, acid or alkali, confirming in this regard its assumed identity with tetanal toxin. Detailed studies of this crystalline toxic protein are now in progress.

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REFERENCES

1. Lamanna, C., McElroy, O. E., and Eklund, H. W., Science, 103:613 (May 17), 1946.
2. Pillemer, L., Wittler, R., and Gronberg, D. B.: Science, 103:615 (May 17), 1946.